

ABSTRACT OF THE DISCLOSURE

A single source precursor for depositing ternary I-III-VI₂ chalcopyrite materials useful as semiconductors. The single source precursor has the I-III-VI₂ stoichiometry “built into” a single precursor molecular structure which degrades on heating or pyrolysis to yield the desired I-III-VI₂ ternary chalcopyrite. The single source precursors effectively degrade to yield the ternary chalcopyrite at low temperature, e.g. below 500°C, and are useful to deposit thin film ternary chalcopyrite layers via a spray CVD technique. The ternary single source precursors according to the invention can be used to provide nanocrystallite structures useful as quantum dots. A method of making the ternary single source precursors is also provided.